

## AMENDMENTS TO THE CLAIMS

1-58. (Canceled)

59. (Currently amended) A Faraday cup detector array, comprising:

(a) a plurality of Faraday cups, ~~the plurality of cups having a pitch of less than a millimeter;~~

(b) a partially insulated conductive housing in which the plurality of cups is supported, the conductive housing being electrically connected to a reference potential; and

(c) means for electrically connecting the plurality of cups to an electronic interface,

wherein each Faraday cup has a unit cell comprising two conductive material-clad insulating walls separated by a U-shaped conductive material, each insulating wall having a first conductive surface in electrical contact with the U-shaped conductive material and a second conductive surface electrically connected to the reference potential, the U-shaped conductive material and two first conductive surfaces defining a conductive cup, and

wherein each unit cell includes a means for electrically connecting the conductive cup to the electronic interface.

60. (Original) The array of Claim 59, wherein the conductive housing comprises aluminum.

61. (Original) The array of Claim 59, wherein the reference potential is ground potential.

62. (Original) The array of Claim 59, wherein the conductive material comprises copper.

63. (Original) The array of Claim 59, wherein the conductive material-clad insulating wall comprises a copper/fiberglass/copper laminate sheet.

64. (Original) The array of Claim 59, wherein the means for electrically connecting the conductive cup to the electronic interface is selected from the group consisting of a metal wire and a metal foil.

65. (Original) The array of Claim 59 comprising 64 Faraday cups.

66. (Original) The array of Claim 59 comprising 256 Faraday cups.

67. (Currently amended) A Faraday cup detector array, comprising:

(a) a plurality of Faraday cups, ~~the plurality of cups having a pitch of less than a millimeter;~~ and

(b) a partially insulated conductive housing in which the plurality of cups is supported, the conductive housing being electrically connected to a reference potential, wherein the cup comprises a conductive material isolated from the housing through an insulator,

wherein the conductive housing comprises an oxidizable metal block having a length, width, and thickness, and a plurality of channels machined through its thickness for receiving the cups,

wherein the block is bonded to an insulating substrate having means for electrically connecting the cup to an electronic interface, the means for electrically connecting the cup to the interface being in electrical connection with the cup.

68. (Original) The array of Claim 67, wherein the oxidizable metal is selected from the group consisting of aluminum, copper, nickel, and titanium.

69. (Original) The array of Claim 67, wherein the conductive material comprises copper.

70. (Original) The array of Claim 67, wherein the reference potential is ground potential.

71. (Original) The array of Claim 67, wherein the insulator comprises aluminum oxide.

72. (Original) The array of Claim 67, wherein the insulating substrate comprises a printed circuit board.

73. (Original) The array of Claim 67, wherein the means for electrically connecting the cup to the electronic interface is a trace on a printed circuit board.

74. (Original) The array of Claim 67, comprising 64 Faraday cups.

75. (Original) The array of Claim 67, comprising 256 Faraday cups.

76. (Original) The array of Claim 67, wherein the array is a two-dimensional array.

77. (Currently amended) A Faraday cup detector array, comprising:

(a) a plurality of Faraday cups, ~~the plurality of cups having a pitch of less than a millimeter;~~

(b) a partially insulated conductive housing in which the plurality of cups is supported, the conductive housing being electrically connected to a reference potential, wherein the cup comprises a conductive material isolated from the housing through an insulator,

wherein the conductive housing comprises a silicon wafer having a length, width, and thickness, and a plurality of wells formed into its thickness for receiving the cups; and

(c) means for electrically connecting the cup to an electronic interface, the means for electrically connecting the cup to the interface being in electrical connection with the cup.

78. (Original) The array of Claim 77, wherein the conductive material is selected from the group consisting of polysilicon and tungsten.

79. (Original) The array of Claim 77, wherein the reference potential is ground potential.

80. (Original) The array of Claim 77, wherein the insulator comprises silicon dioxide.

81. (Original) The array of Claim 77, wherein the means for electrically connecting the cup to the electronic interface is a wire.

82. (Original) The array of Claim 77, comprising 64 Faraday cups.

83. (Original) The array of Claim 77, comprising 256 Faraday cups.

84. (Original) The array of Claim 77, wherein the array is a linear array.

85. (Original) The array of Claim 77, wherein the array is a two-dimensional array.

86. (Original) The array of Claim 77, wherein the wells are formed by a deep reactive ion etching process.

87. (Original) The array of Claim 77, wherein the wells are formed by an anisotropic hydroxide etching process.

88. (Original) The array of Claim 77 having a pitch from about 100  $\mu\text{m}$  to about 500  $\mu\text{m}$ .